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DEMONSTRATION OF ACTIVITIES DESIGNED TO PROMOTE COGNITIVE GROWTH.

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ABSTRACT

The assessment profile of a 9-year-old blind child with normal intelligence is presented to illustrate activities useful in remediating lags in reasoning. Described are six activities from a module entitled "The Long and The Short of It", which provides the student with opportunities to use arbitrary units of measure and thereby understand that change in the position of an object does not change the length of the object (SBH)

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DEMONSTRATION OF ACTIVITIES DESIGNED TO PROMOTE COGNITIVE GROWTH

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Thus far in this presentation there has been an overview of the projection assessments, a discussion of the analysis of gains in reasoning made by pupils who had experienced seventeen months of remediation and a review of the forthcoming teachers guide. At the center of these three components is the actual development and implementation of activities that promote growth in reasoning abilities.

The assessment results serve as profile of the reasoning activities displayed by the student. They give the teacher a global picture of the child's reasoning abilities in the areas of classification, conservation, spatial relations/mental imagery and abstract operations.

When provided this information, how does one design a program for the remediation of apparent lags in reasoning? All too often test scores and comparisons do not incorporate a means for eliminating apparent deficits or a means for preventing them.

It is the teacher's job to be:

1) aware of the student's reasoning levels,
2) have the ability to develop activities which are appropriate for the student's reasoning level and for his chronological age and as well as
3) the ability to integrate activities into the existing curriculum.

Let us hold Point 1 in mind as we look at an abbreviated assessment profile. The subject is a nine year old congenitally blind male with normal intelligence.

Generally the pupil is functioning below the level considered appropriate for his age in the four Piagetian reasoning areas, classification, conservation, spatial relations/mental imagery and abstract operations.

Let us look at the specific subtest Conservation of Length assessments.

Part one, assesses the subjects awareness of the permanence of length in wooden rods, despite their variation in arrangement.

First, the child is given four rods and is asked to choose two that are equal in length. Next, with both hands on the parallel rods one rod is pushed to the right. The examiner asks:

Are the rods the same now?

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The procedure is repeated, this time the other rod is pushed to the left and the child again is asked if both rods are the same length.

Following this, still having the child hold both rods, both rods are pushed, one to the left and one to the right. The child is then asked if the two rods are the same length.

Part two of the conservation of length assessment assesses the subject's awareness of the invariance of length despite figural transformations.

First, he is presented with a 16" rod and four 4" rods. He is asked:

> Is there the same amount of wood in these four pieces as there is in the one long piece?

Or if the child is young he is asked:

> If these were roads I walked down this one (the 16" one) and you walked down this one (one made by joining the four 4" pieces) would we walk the same distance?

Next, the four are placed in a "W" formation and the child is asked:

> Is there the same amount of wood in all of these as there is in this?

The procedure and questioning is repeated with the four short rods placed below the long one.

Finally the student is presented with a different formation and is asked:

> Is there the same amount of wood in all of these as there is in this?

The nine year old blind child tested on these assessments assumed that rearrangement of the rods would effect the length, a response of this type indicates a developmental delay in reasoning abilities that are related to the conservation of length tasks.

If you had this blind child as your student, where would you want to start? The child is in the 5th grade.

- -In the areas of math he is functioning at the 3rd grade level,
- -His mobility skills are inadequate for his chronological age,
- -Language and reading abilities are near normal,
- -His maturity and interest level are at a 6 year level.

The following slides present an orderly sequence of activities that were developed for and implemented with students participating in the Cognitive Research Project that provide necessary skills and abilities that are prerequisite to the ability to conserve length.

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One might question, "Does it really matter in the course of a persons life if he can or cannot "conserve" length?" His life will go on!

But we must keep in mind that it is the experiences with people and objects in the child's environment that provided the foundation, the building blocks for the necessary reasoning abilities that enable a person to think logically, in for example, the Conservation of Length assessment.

Activities in the module entitled "The Long and The Short of It" provide opportunities for the student to use arbitrary units of measure and thereby understand that change in the position of an object does not change the length of the object.

In Activity #1, words are introduced which are associated with concepts of measurement. As the student compares the size of different objects he will realize that the same object can be:

Long and Short (longer than one object, but shorter than another)
Narrow and Wide (narrower than one object, but wider than another)
Small and Big (smaller than one object but bigger than another)

During a crafts session, the student can build objects which are larger and smaller than other objects. If the student makes a house and then a flower, the flower should be smaller than the house.

In Activity #2, the student experiments with measurement techniques which do not use standard units of measure (inches or centimeters). In it the student is presented with a collection of straight edge objects. Following this, the student determines the length of the room by measuring from one end of it to the other with objects other than a ruler or tape measure, e.g., with a book or box. Measuring the length can be difficult if the student loses his place when the object is moved along the surface being measured. To avoid this, the student marks the beginning and end point of the measuring object with thick rubber tape. The student can then chart the length of the room using the different arbitrary measures.

In Activity #3, the student extends his ability to think comparitively - for example to know that the table is longer than the box but the wall segment is longer than the box.

The student estimates the length of each object and then measures each object by taping the twine to one end point and then to the other and cutting a piece of twine which is the length of the object. The pieces of twine can then be taped to the blackboard or a blank wall, and the child can compare the relative lengths. As an alternate activity the student can measure and compare the height or arm lengths of other members of the class.

In Activity #4, the objective is to develop an appreciation of distance and proportion and to demonstrate that such words as "near" and "far away" are relative terms.

The student selects an object or area in a room which will be used as the referent. In this instance "home base" is a corner of the room. Distances between various objects and the referent object are measured comparing the lengths of twine for each of the referent object measurements are compared; in carrying out the activity, the student has described the distance from the referent to the object, thus he has gained in understanding that the description of distance is relative.

In activity #5, the student determines that although units of measurement may change, the length remains the same.

The student estimates a given distance using his shoe as the arbitrary unit of measure. The student then determines the distances by walking, placing one foot in front of the other. He then compares the length of the same distances using a different arbitrary unit of measurement. The student finds that the number of units of measure for the same distances changes.

If the student can explain that the distance itself did not change he is developing an understanding of conservation of length.

In Activity #6, through the use of arbitrary units of measurement, the student compares the length of a shoe and a twelve inch ruler by using poker chips and one inch blocks. As units of measure, he should realize that although the number of the arbitrary units may vary, the actual length does not change.

Through this activity the student demonstrates that arbitrary measures can be used to describe size and that although the unit of measure may change, the size of the object is constant. Furthermore, since each cube is one inch and the ruler is 12 inches long, the student is introduced to standard units of measurement.

In the final activity, the student uses twine to measure the length of different body parts, e.g., leg, arm and hand. The student compares the length of one body part using twine which is the length of another body part as the unit of measure.

Following this, one inch cubes are aligned along the twine to determine the length in wooden cubes.

The student then compares the length of different body parts using a cube as an arbitrary unit of measure since each cube is one inch long, standard units of measures are stressed.

Thus far you have been introduced to one of the modules of activities that have been designed by the Cognitive Research Project to enhance reasoning abilities in the visually handicapped population.

In order to develop and implement activities with a Piagetian orientation, the teacher stresses processes involved in the student approach to a given problem more then the product or the answer to the problem.

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